

REMARKS/ARGUMENTS

Reconsideration and withdrawal of the outstanding grounds of objection and/or rejection are respectfully requested in light of the above amendments and the remarks which follow.

The Examiner has objected to the drawings because they do not include reference signs mentioned in the description.

By this response, applicants have amended the description to insert appropriate reference numbers consistent with the reference numbers utilized in the drawings. As a result, no correction of the drawings is required.

The Examiner has rejected claims 1-13 under 35 U.S.C. § 103 as unpatentable over either Jorgensen (US 6,568,187) or Howard (US 2,479,573) in view of Ansart et al. (6,105,371). The Examiner acknowledges that neither Jorgensen nor Howard teach dilution holes that are sized such that substantially equal quantities of dilution air flow into the flow path in the zones adjacent the inlet end and outlet of the transition piece body. The Examiner contends, however, that Ansart teach cooling air flow variations “which have the improvement of making the cooling air flow rate substantially constant in the upstream and downstream zones by varying the permeability of the holes.”

By this Amendment, applicants have amended independent claim 1 to incorporate the limitations of original dependent claim 4 which specifically identifies the X, Y, Z coordinates of the dilution holes as specified in Table I of the specification.

The tertiary reference to Ansart relied upon by the Examiner seeks to optimize the temperature profile at the outlet of a high temperature combustion chamber by controlling the rate of flow of cooling air in the wall zones disposed in the downstream part of the combustion chamber. The holes in Ansart are sized and arranged to achieve cooling uniformity and thus, the

“air flow permeability” is varied in order to compensate for the effects of an increase in pressure drop along the flow path. In the present invention, dilution holes in the inlet and outlet zones are sized and located such that substantially equal quantities of dilution air flow enters into the flow path at the inlet and outlet ends of the transition piece. Thus, the arrangement and size of holes in Ansart are designed to achieve a different purpose than the dilution holes in the present invention. Ansart is concerned with cooling while in the present invention, the concern is defective dilution mixing and inefficient emissions reduction. Moreover, there is no suggestion in any of the applied references of the specific hole diameters and locations as now required by independent claim 1.

Further in this regard, the Examiner contends that the precise locations in the claimed locations are deemed an obvious matter of choice. Since the specified hole sizes and locations are designed to achieve a specific function expressly noted in the specification, the Examiner’s mere assertion of obvious matter of choice is insufficient to establish prima facie obviousness. In any event, applicants submit herewith a Rule 132 Declaration by the inventor, Derrick Simons, establishing that the discovery of precise hole sizes and locations is not at all simply an obvious matter of choice. For example, the Declarant states:

The hole locations/sizes or hole configuration geometry were selected based on multiple laboratory iterations and testing of the hole configuration geometry, with an emphasis on enhancing operation and reducing emissions.

Each successive hole configuration geometry was defined through evaluation of previous performance results and engineering analysis of past hole configuration geometries during laboratory iterations and testing.

Numerous hole configuration geometries were investigated and approximately 7 or 8 hole configuration geometries were actually testing to determine an enhanced hole configuration geometry to

balance both emissions and performance of the combustion system.

Based on my professional experience and consulting with other engineers with additional experience in combustion systems, it is industry practice to determine desirable hole configuration geometries based on laboratory iterations and testing of hole configuration geometries. No other methodology to develop such hole configuration geometries, with an emphasis on enhancing operation and reducing emissions, is presently known to be as effective. The experimentation involved is neither routine or predictable.

The inventor also notes that Ansart relates to a combustion chamber and not a transition piece, and that the reason for achieving the desired differential permeability (different flow rates at different locations in the combustion chamber wall to accommodate different pressure drops) is to optimize the temperature profile of the combustion chamber by controlling cooling flow. The inventor continues that Ansart's teaching of varying the air flow permeability is at odds with the present invention, where substantially equal quantities of air flow into the flow path in the first and second zones.

For all of the above reasons, it is respectfully submitted independent claim 1 and claims dependent thereon are patentable over the prior art as cited and applied by the Examiner.


Independent claim 9 contains similar limitations, and also incorporates the hole locations and sizes in accordance with Table I of the specification. For essentially the same reasons as presented above, the subject matter of independent claim 9 as well as dependent claims 10-13 is also patentable over the applied prior art.

The application is now believed to be in condition for allowance, and early passage to issue is respectfully requested. In the event, however, any small matters remain outstanding, the Examiner is encouraged to telephone the undersigned so that the prosecution of this application can be expeditiously concluded.

The Commissioner is hereby authorized to charge any deficiency in the fee(s) filed, or asserted to be filed, or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Account No. 14-1140.

Respectfully submitted,

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